

## CLAIMS

What is claimed is:

- 5        1.        A variably positionable coupler mountable on a curved surface, comprising:  
             a base formed with an upper side and a lower side,  
                     wherein the lower side is a substantially flat planar surface;  
             means for mounting the base on the curved surface;  
             a tub adjustably connectable to the base;  
10        a plug repositionably attachable to the tub;  
             a neck rotatably insertable in the plug,  
                     wherein the neck is formed for securing a shaft to the neck; and  
             a clevis mechanism slidably and demountably engageable with the plug and the neck.
- 15        2.        A variably positionable coupler mountable on a curved surface as recited in claim 1, further  
comprising opposing yokes monolithically extending at substantially right angles from the upper side  
of the base.
- 20        3.        A variably positionable coupler mountable on a curved surface as recited in claim 2, further  
comprising one or more bores formed in the base with a proximal end and a distal end, and further  
wherein the one or more bores are shaped for removable engagement with a bolt.
- 25        4.        A variably positionable coupler mountable on a curved surface as recited in claim 3, further  
comprising a frustoconical recess formed adjacent the proximal end of the one or more bores.
5.        A variably positionable coupler mountable on a curved surface as recited in claim 4, further  
comprising a concave cup formed adjacent the distal end of the one or more bores.

6. A variably positionable coupler mountable on a curved surface as recited in claim 1, wherein the mounting means is a plurality of ball washer assemblies.
7. A variably positionable coupler mountable on a curved surface as recited in claim 6, wherein the plurality of ball washer assemblies includes a second threaded bolt formed with a first diameter.
8. A variably positionable coupler mountable on a curved surface as recited in claim 7, wherein the plurality of ball washer assemblies includes a ball washer.
9. A variably positionable coupler mountable on a curved surface as recited in claim 8, wherein the ball washer is formed with a substantially hemispherical exterior surface, an interior surface, and a duct between the substantially hemispherical exterior surface and the interior surface formed with a second diameter larger than the first diameter of second threaded bolt.
10. A variably positionable coupler mountable on a curved surface as recited in claim 9, further comprising a nut assembly.
11. A coupler system, comprising:  
a base formed with opposing yokes;  
means formed in the base for mounting the base on a curved surface;  
a plurality of ball washer assemblies combinable with the mounting means; and  
a boom-swivel device detachably fixable to the base for securing a shaft to the coupler system.
12. A coupler system as recited in claim 11, wherein the opposing yokes are formed with opposing apertures.
13. A coupler system as recited in claim 11, wherein the mounting means includes a bore formed in the base.

14. A coupler system as recited in claim 13, wherein the mounting means includes a recess formed in one end of the bore.

15. A coupler system as recited in claim 14, wherein the mounting means includes a cup formed in the other end of the bore.

16. A coupler system as recited in claim 11, wherein the plurality of ball washer assemblies includes a bolt formed with a first diameter.

17. A coupler system as recited in claim 16, wherein the plurality of ball washer assemblies includes a ball washer formed with a duct having a second diameter larger than the first diameter of the bolt.

18. A coupler system as recited in claim 11, wherein the plurality of ball washer assemblies includes a nut assembly.

19. A coupler system as recited in claim 11, wherein the boom-swivel device includes at least one tub adjustably connectable to the opposing yokes.

20. A coupler system as recited in claim 11, wherein the boom-swivel device includes a plug repositionably attachable to the tub.

21. A coupler system as recited in claim 11, wherein the boom-swivel device includes a neck for supporting a shaft rotatably insertable in the plug.

22. A coupler system as recited in claim 11, wherein the boom-swivel device includes a clevis mechanism engageable with the plug and the neck.

23. A method for manufacturing a load-bearing coupler system, comprising:  
forming a base mountable on a surface;  
making one or more ball washer assemblies for joining the base to a surface;  
shaping a tub for adjustable connection to the base;  
5 configuring a plug for repositionable attachment to the tub;  
designing a neck for rotatable insertion in the plug;  
installing a clevis mechanism in the plug and neck;  
securing the load-bearing shaft to the neck; and  
mounting the base on the surface.

24. A method for manufacturing a load-bearing coupler system as recited in claim 23, wherein the base forming step includes the substeps of:

configuring the base to have an upper side, a lower side, and opposing yokes extending monolithically at substantially right angles from the upper side of the base;

15 forming at least one aperture in the opposing yokes;  
providing at least one first threaded bolt insertable through the at least one aperture;  
shaping the base to include a plurality of hollow bores between the upper side and lower side;  
including a conical recess in one end of the plurality of bores adjacent the upper side;  
including a concave cup in one end of the plurality of bores adjacent the lower side; and  
20 including one or more nut assemblies for securing the base to the surface.

25. A method for manufacturing a load-bearing coupler system as recited in claim 24, wherein the one or more ball washer assemblies making step includes the substeps of:

including one or more second threaded bolts formed with a frustoconical cap;  
25 shaping the one or more second threaded bolts to have a first diameter;  
providing one or more ball washers;

shaping the one or more ball washers to include a substantially hemispherical exterior surface, an interior surface, and a duct between the substantially hemispherical exterior surface and the interior surface through which the one or more bolts may be inserted;

shaping the duct to have a second diameter larger than the first diameter of the one or more second threaded bolts; and

installing one or more nut assemblies on the one or more ball washer assemblies.

5        26.     A method for manufacturing a load-bearing coupler system as recited in claim 25, wherein the tub shaping step includes the substeps of:

             configuring the tub to include a chamber defined by a circumferential wall;

             forming opposing threaded hollow holes in the circumferential wall of the tub for engagement of the at least one first threaded bolt; and

10            inserting the at least one first threaded bolt through the opposing hollow holes and the at least one aperture in the opposing yokes.

27.     A method for manufacturing a load-bearing coupler system as recited in claim 26, wherein the plug configuring step includes the substeps of:

15            shaping the plug to include a body having a leading end and a following end;

             mounting monolithically a disk on the leading end of the plug insertable into the chamber of the tub;

             forming a groove in the body adjacent the following end for providing opposing arms; and

             installing opposing hollow tubes in the opposing arms of the body.

20        28.     A method for manufacturing a load-bearing coupler system as recited in claim 27, wherein the neck designing step includes the substeps of:

             shaping the neck to include a substantially truncated member formed with a plate;

             attaching monolithically a connector extension to the plate; and

25            forming a passage through the substantially truncated member that is alignable with the opposing hollow tubes in the opposing arms of the body.

29. A method for manufacturing a load-bearing coupler system as recited in claim 28, wherein the clevis mechanism installing step includes the substeps of:

forming a clevis pin having a first end, a second end, and a top portion formed monolithically in the first end;

5 shaping the clevis pin for slidable insertion through the opposing hollow tubes in the opposing arms of the plug and through the passage in the substantially truncated member of the neck;

forming a lumen in the top portion of the clevis pin; and

shaping a wire section for lockable attachment to the lumen in the top portion and for loopable engagement with the second end.

10 30. A method for manufacturing a load-bearing coupler system as recited in claim 29, wherein the load-bearing shaft securing step includes the substep of welding one end of the shaft to the connector extension of the neck.

15 31. A method for manufacturing a load-bearing coupler system as recited in claim 30, wherein the base mounting step includes the substeps of:

forming one or more holes in the surface dimensionally receptive to the one or more second threaded bolts;

connecting the tub to the base;

20 attaching the plug to the tub;

inserting the neck in the plug;

installing the clevis mechanism on the plug and neck; and

mounting the base on the surface using one or more ball washer assemblies.